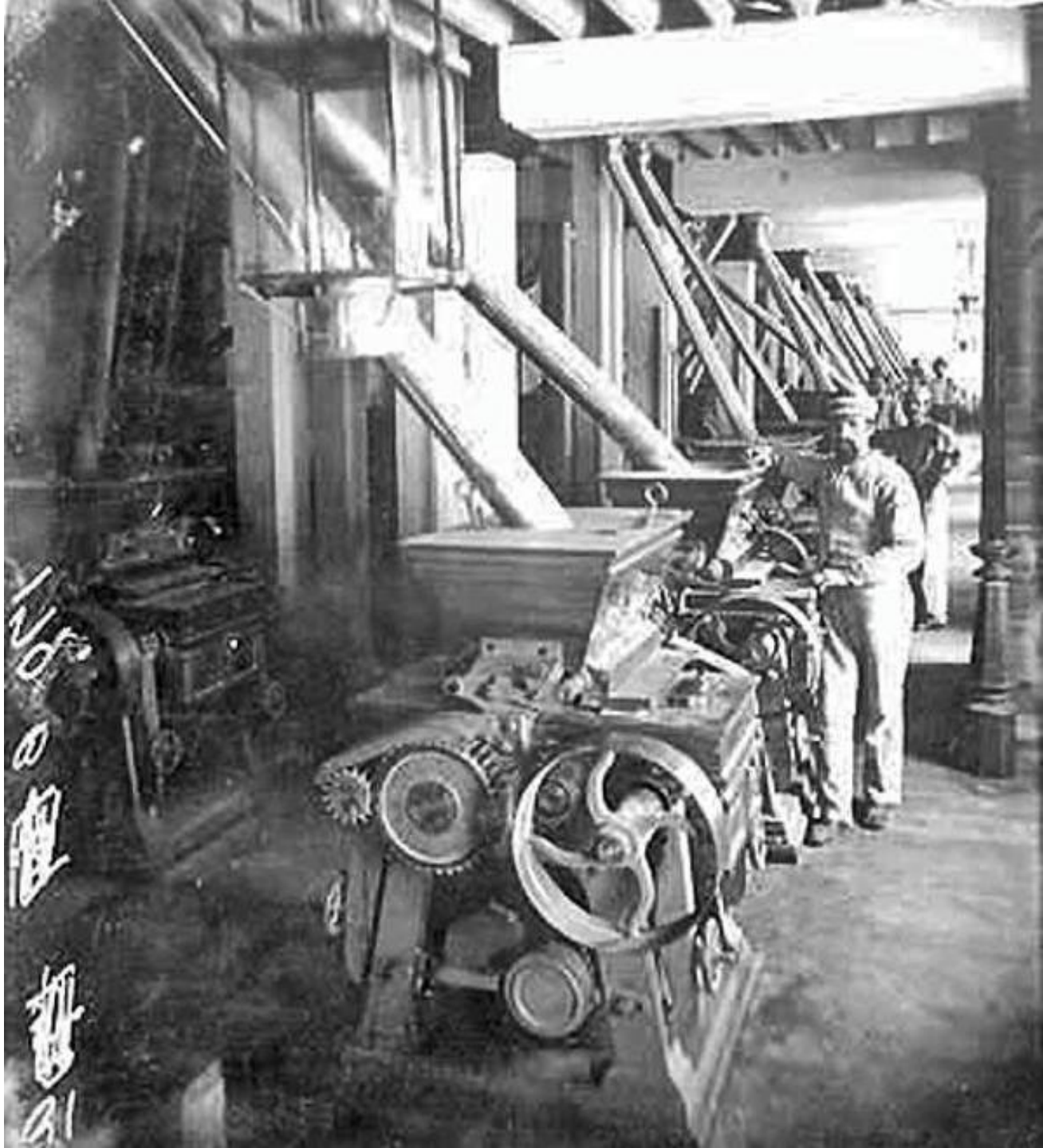
Tools and Performance Indicators to Measure Mill Performance.

Peter Lloyd – US Wheat Associates
MEENA Region.

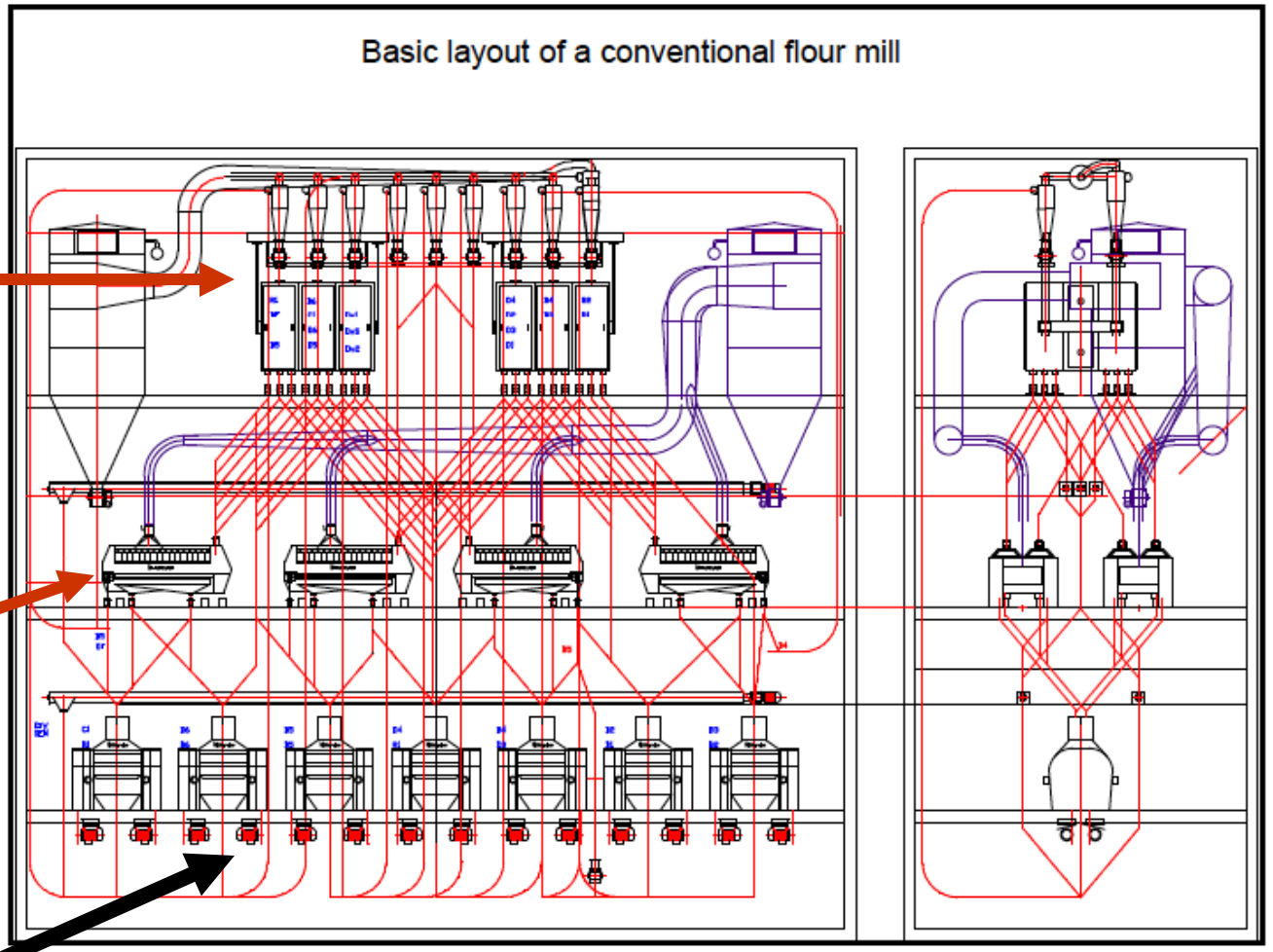
Cairo, Egypt May 2016

Back when I was a young man, and handsome, **and thin…….**

Actually, this is even before my time, but I remember the equipment.



Great Mills result from good planning and skillful, careful operation..


Basic layout of a conventional flour mill

Part one – The Measures

- Financial Statements.
  - Balance Sheet
  - Income and Expenditure
- Extraction Rates
  - Dirty Wheat
  - Clean Wheat
  - Finished Products
- Capacity Utilization
- Key Ratios

Part Two – the Solutions

- Balance in the Mill
  - Break Releases
  - Purifiers
  - Bare Dressing
  - Hollow Grinding
  - “Invisible Loss”
- Raw materials
  - Blending Philosophy
  - Cycles
- Controls
  - Statistics in the mill
    - Lab

Financial Statements

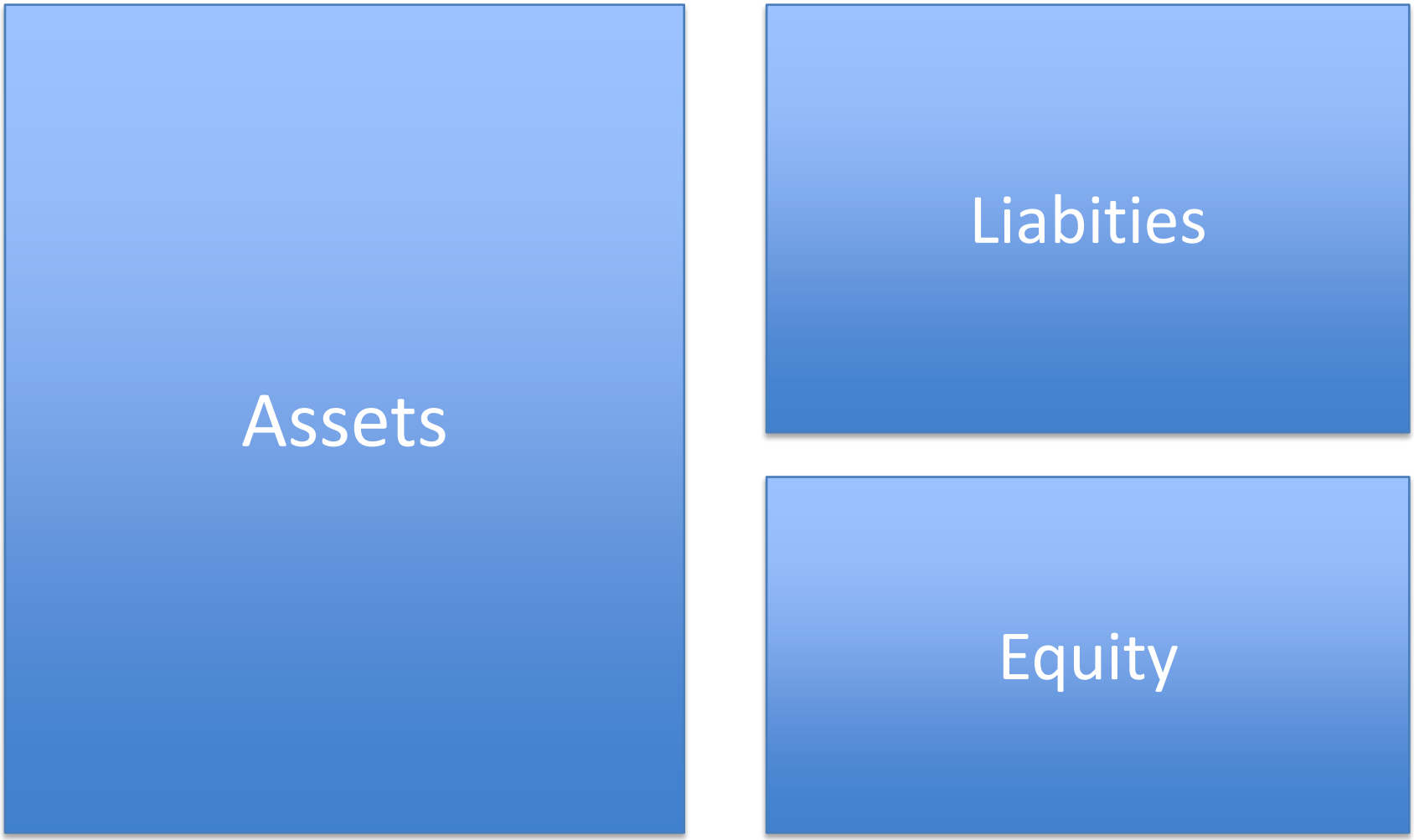
The Ultimate Measure of how well a mill is performing.

Don’t be frightened of them – understand them!

The Balance Sheet

- This is a ‘snapshot’ of the company’s finance at a given date in time.
- A balance sheet is always dated.
- This document together with the Income and Expenditure Statement and Equity statement have to be filed every year.

The Balance Sheet



The Balance Sheet

What We have

What we owe to others

What we are worth

Assets – What we have

- Split into CURRENT assets – which can be converted into cash within one year.
- Other Assets like equipment, buildings etc. which may take longer to sell.

Liabilities – What we owe to others

- What we owe to others.
- Split into Current liabilities – which we expect to pay within a year.
- Long term liabilities – such as loans for plant and equipment, and other long-term credits.

Equities – what are we worth

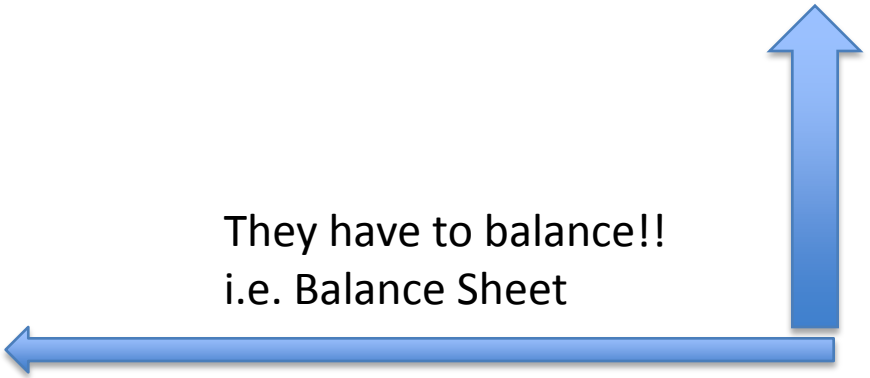
- Value of the company to the shareholders.

Blunders Balance Sheet

Blunder Milling Corp. Dakar, Senegal
Balance Sheet as at December 31,2006
Balance Sheet (US method)

Assets		United States Dollars
Current Assets		
Cash		
Long term Balance at 31 dec 06	$	6,800,000
Short Term balance at 31 dec 06	$	4,200,000
Current account balance at 31 dec 06	$	320,000
total Cash	$	11,320,000
Receivables		
Credit sales on flour	$	3,515,178
Credit sales on bran	$	273,403
total receivables	$	3,788,581
Inventories		
Finished flour on hand	$	1,669,360
Wheat stock on hand	$	1,400,000
Packing material on hand	$	742,500
Wheat in Transit (L.Dreyfus)	$	2,800,000
Work in progress	$	79,200
total Inventories	$	6,691,060
Prepaid Expenses and other current assets		
Corporation tax prepaid	$	(544,900)
total prepaid expenses	$	(544,900)
Total current assets	$	21,254,741
Fixed Assets		
Investments		
Company pension scheme	$	5,000,000
Property, Plant and Equipment		
Land	$	2,000,000
Buildings	$	1,000,000
Equipment	$	20,000
Vehicles and office equipment	$	50,000
Total fixed Assets	$	3,070,000
Total Assets	$	24,324,741

Liabilities and Shareholders Equity		
Current Liabilites		
Accounts payable		
Letter of Credit L.Dreyfus Corp.	$	2,800,000
Corporation Tax payable	$	(544,900)
Accrued expenses	$	-
Dividends payable	$	(400,000)
Current portion of long term debt	$	-
Total current liabilities	$	1,855,100
Long term debt		
Borrowings	$	-
Other long term liabilities	$	-
Company pension fund	$	5,000,000
total long-term debt	$	5,000,000
Stockholders equity		
Capital stock	$	1,000,000
Capital in excess of par value of stock	$	15,234,941
Retained earnings	$	1,234,700
Total Stockholders Equity	$	17,469,541
Total Liabilties and stockholders equity	$	24,324,741



They have to balance!!
i.e. Balance Sheet

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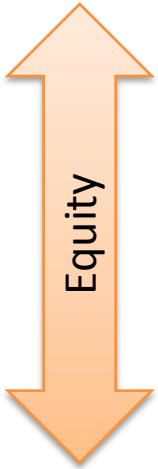
Total Assets



Liabilities and Shareholders Equity

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Capital in excess of par value of stock	$	15,234,941
Retained earnings	$	1,234,700
Total Stockholders Equity	$	17,469,641
Total Liabilties and stockholders equity	$	24,324,741

Income Statement

Blunder Milling Corp. Dakar, Senegal
Income Statement as at December 31,2006
US Reporting Method

	United States Dollars	
Net Sales	$	23,047,200
Cost of goods sold	$	-20,641,035
Selling and distribution expenses	$	-
Administrative expenses	$	-
Interest Revenue and expenses	$	-204,549
Gain or loss on equipment sales	$	-
Pretax Income from continuing operations	**$**	**2,201,616**
Training Tax expense	$	-22,016
Income tax expense	$	-544,900
Income from continuing operations	**$**	**1,634,700**
Discontinued operations (gain or loss or disposal)	$	-
Dividend paid to shareholders	$	-400,000
Extraordinary items	$	-
Cumulative effect of change in accounting principle	$	-
Net Income	**$**	**1,234,700**

Financial Statements:

Notes to financial statements;
Blunder Milling Corporation is an active Limited Liability Share Company established in the Republic of Senegal in October of 1960. The company registration number is 12345-60.

Shareholding

Shareholding in Blunder milling is composed of 1000 ordinary shares, each of a value of $1,000. These shares are presently held by;

Mr. John Doe:	400 shares
Ms. Carmine Doe:	400 shares
Senegal Development Corporation:	200 shares.

Change in shareholding in the financial year:
Following the death of Mr. Jonathan Doe in 2006, his 400 shares were distributed to his son and daughter in equal parts of 200 shares.

Bank Accounts:

The company presently holds 3 bank accounts with Citibank, Dakar.
Long term deposit account: (Balance at 31/12/06 of $6,800,000.)
Short term deposit account: (Balance at 31/12/06 of $4,200,000.)
Current account: (Balance at 31/12/06 of $ 320,000.)
Interest is paid on long term deposits at 7% net of tax, and on short term deposits at 6% net of tax. Taxation on interest is paid directly by the bank.

Current Assets and Liabilities:

The company concluded a purchase of 10,000mt of wheat in late December 2006 from the Louis Dreyfus Corp, against which a Letter of Credit was issued for $2,800,000. The wheat was in transit at fiscal year end.

The company operates a pension scheme based upon an annually renegotiated non-profit annuity account with the Prudential (Senegal) Ltd. Current surrender value and liabilities under this scheme are calculated at US$5,000,000.

Long Term debt:

The company presently has no long-term debts.

Accrued Expenses:

The company presently has no accrued expenses.

Disposal of Assets:

The company has not disposed of any capital assets and has no discontinued component operations during the accounting year.

Extraordinary items:

No extraordinary items are declared in this year's accounts.

Valuation of fixed assets:

Land, buildings and equipment are declared at their (depreciated) book value.

Cost of Sales:

The company operates on an ex-mill sales basis, and has no selling and distribution expenses. Provision for bad debt is made from current cash assets.

Accountants:

The Board of Directors voted unanimously to retain the services of Messrs. Bougdira & Co., Chartered Accountants for the year ending December 31, 2007.

The following accounts are hereby declared as a fair and accurate presentation of the Blunder Milling Company's financial status as at December 31, 2007.

Souad Bougdira

Souad Bougdira
Bougdira and Company,
Chartered Accountants.
Dakar, Senegal
10th January 2007

Auditors notes are very important!!

Extraction Rates

- **Dirty Wheat** – Flour extraction measured against dirty wheat. (Measure of wheat buying efficiency)

- **First Break Extraction** – Flour extraction measured against clean, tempered wheat. (Measure of mill efficiency)

- **Finished Products** – Flour extraction measured against total finished products (Measure of packing efficiency).

Capacity Utilization

- What percentage of the possible maximum capacity is utilized?
- Based on a maximum of 300 working days per year. (250 more “normal”).

e.g. 250t/day x 300 days/year= 75,000t

Actual milled tons = 65,000

Capacity Utilization = 65,000/75,000= 86.6%

Extraction and Capacity Utilization affect profit the most

Quick Ratios

IAOM MEA Regional Forum 2016

There are many different Financial Ratios – but only those considered the most important are shown here today. The complete list is at the back of the presentation.

Debt Ratio and Debt to Equity Ratios

The debt ratio is defined as total debt divided by total assets:

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

- The debt-to-equity ratio is total debt divided by total equity:

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Current Ratio

- The current ratio is the ratio of current assets to current liabilities:
- Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$
- Short-term creditors prefer a high current ratio since it reduces their risk. Shareholders may prefer a lower current ratio so that more of the firm's assets are working to grow the business.

Quick Ratio or Acid Test

- The quick ratio is an alternative measure of liquidity that does not include inventory in the current assets.
- The quick ratio is defined as follows:

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

- The current assets used in the quick ratio are cash, accounts receivable, and notes receivable. These assets essentially are current assets less inventory

Return on Equity

- Return on equity is the bottom line measure for the shareholders, measuring the profits earned for each dollar invested in the firm's stock.
- Return on equity is defined as follows:

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholder Equity}}$$

Part 2 – The Solutions

- What can we do to influence these measures?

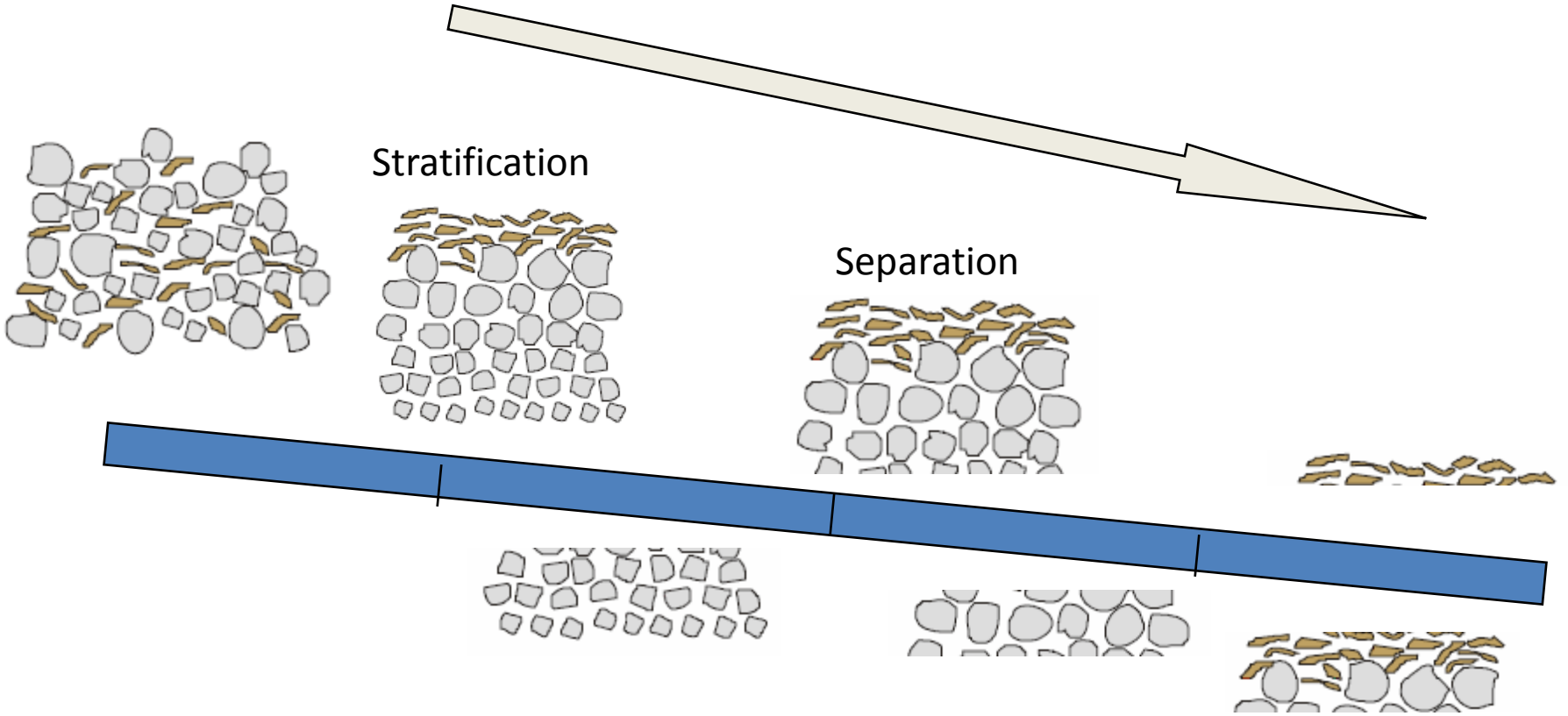
Break Releases

- Probably the single most important setting in the mill.
  - Simple and easy to do.
  - Controls Mass Balance in the mill.
    - USE A TRAY.
    - USE A WEIGHER THAT CAN TAKE THE WHOLE SAMPLE.
    - LEFT TO CENTER, RIGHT TO CENTER.
- USE ONLY MANUFACTURERS SETTINGS!!!!
  - (NOBODY ELSE KNOWS THESE VALUES).

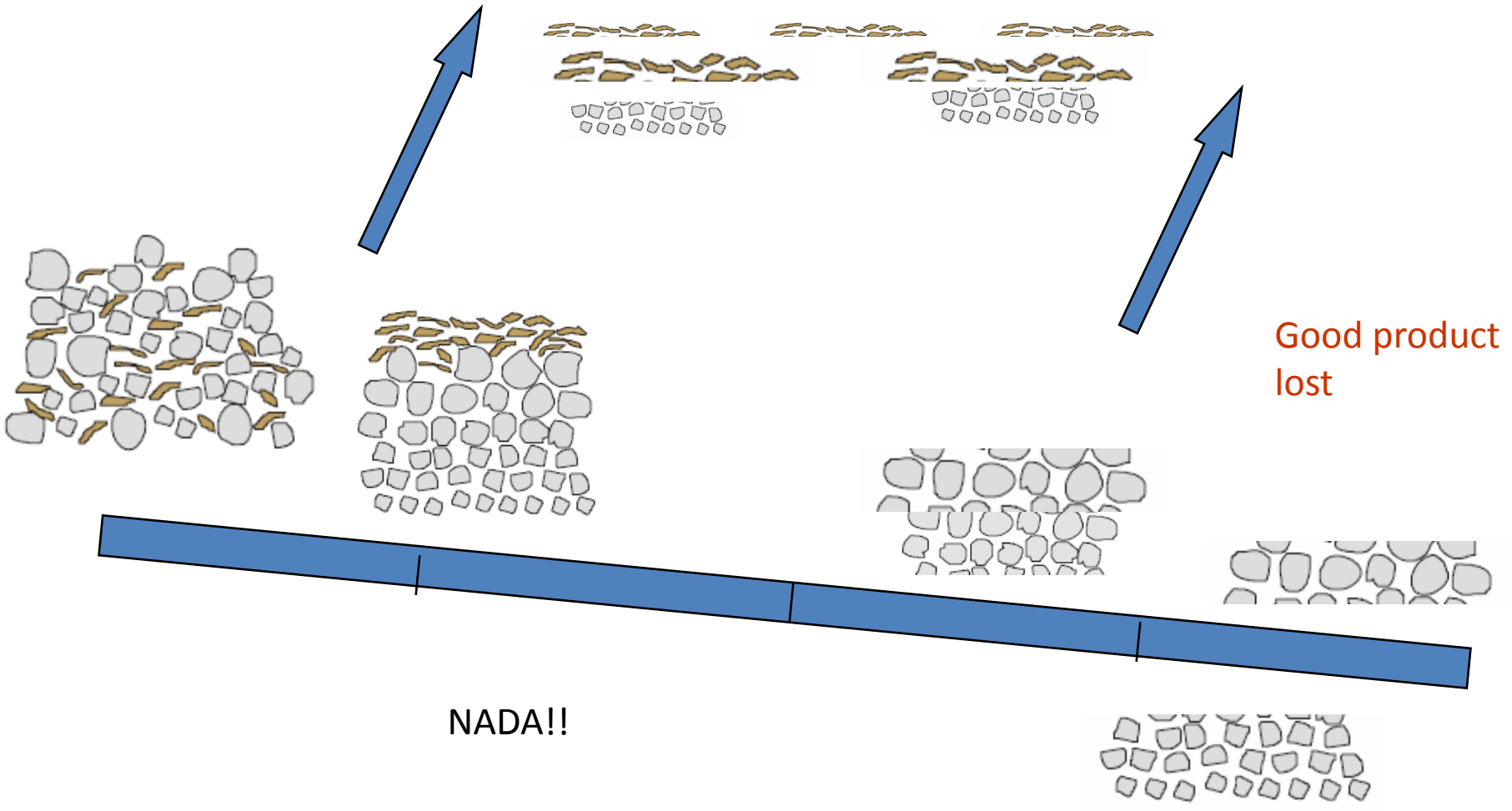
PURIFIERS

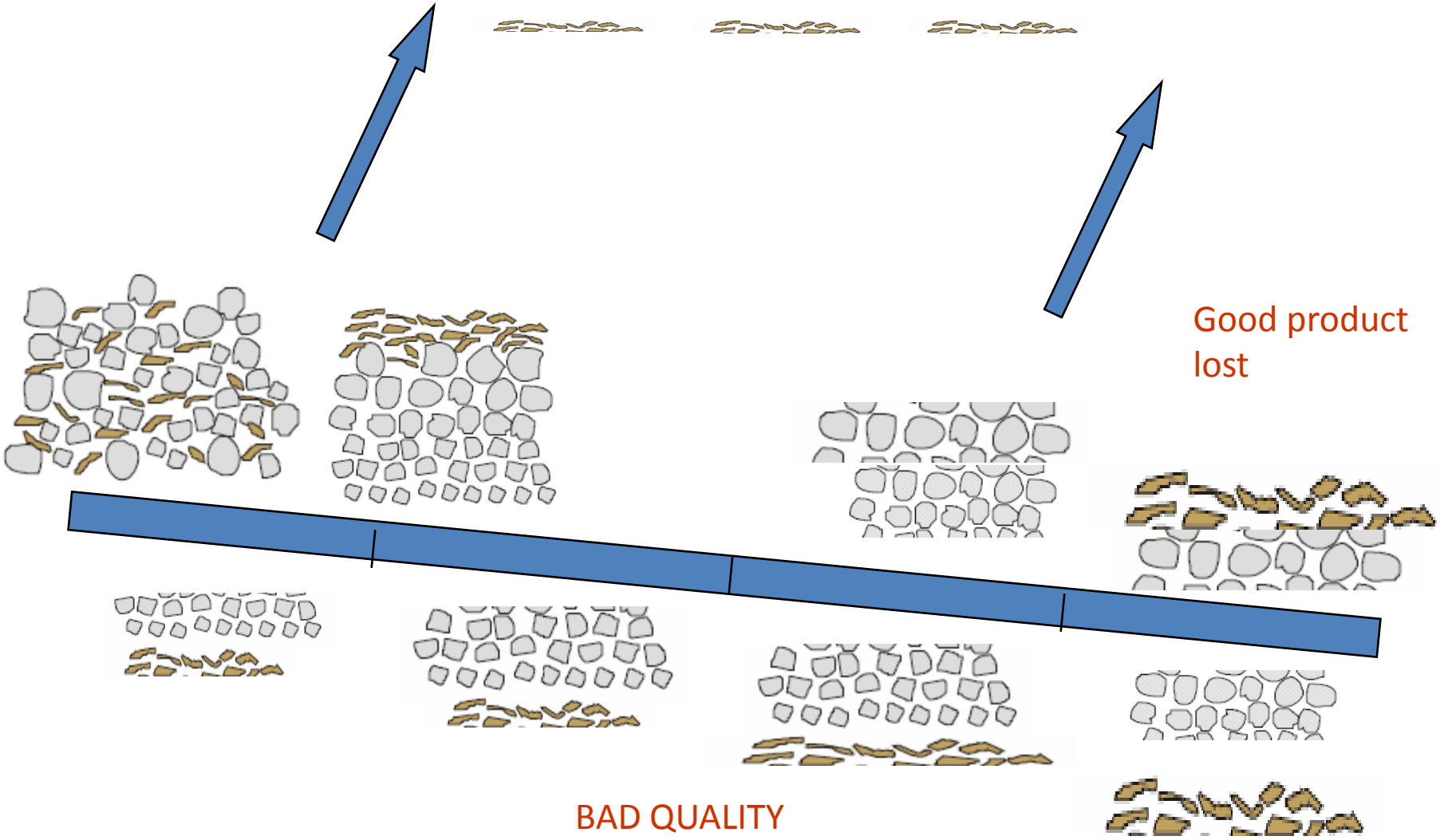
- Your best friend, but can be your worst enemy as they can destroy extraction and quality if poorly set.
  - Clean DAILY
  - Check DAILY
  - Have ample spare sieves available to optimize sieve performance.
- Please do not save money in this area!! It is a very poor investment.

MQRG Polaris Purifier



A well adjusted purifier:


Good product lost
NADA!!
Too Much Air!!

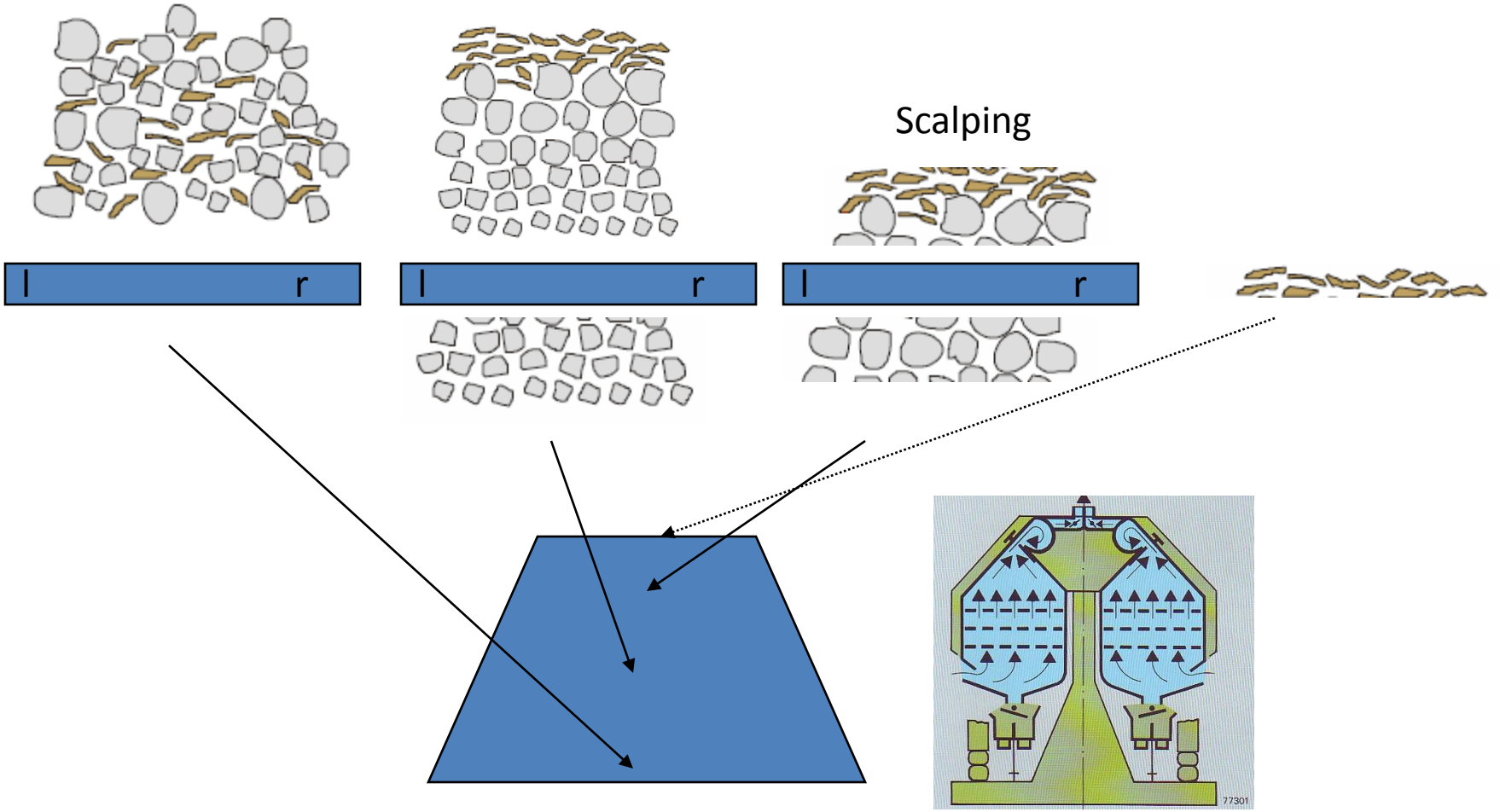


Too Little Air!!

Stratification

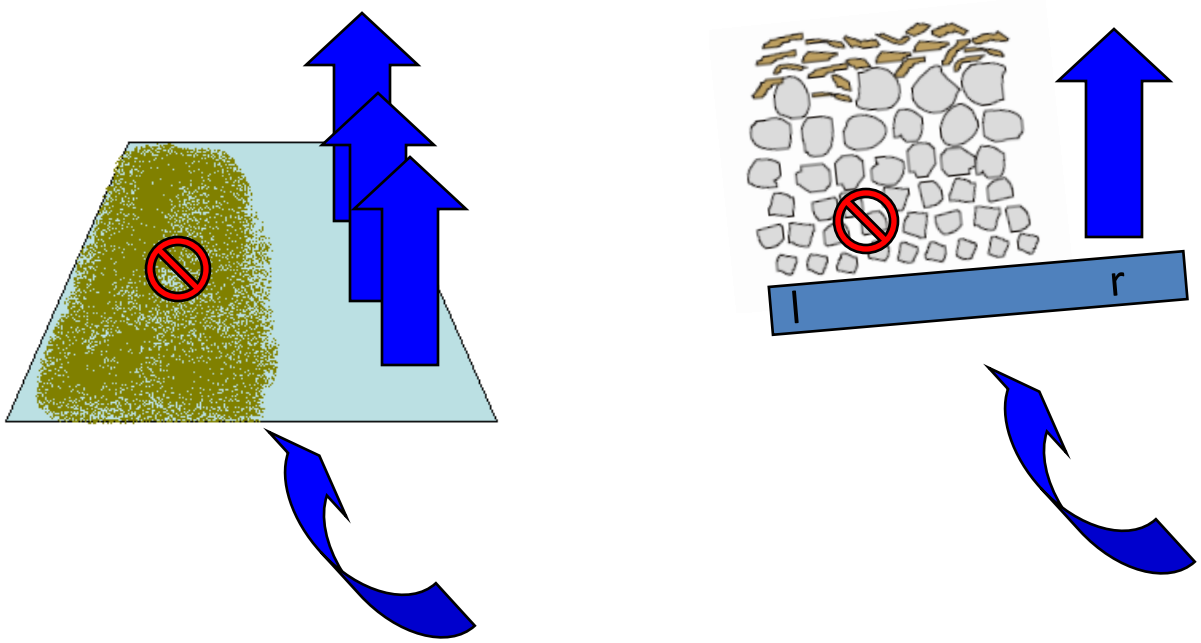
Separation

Scalping

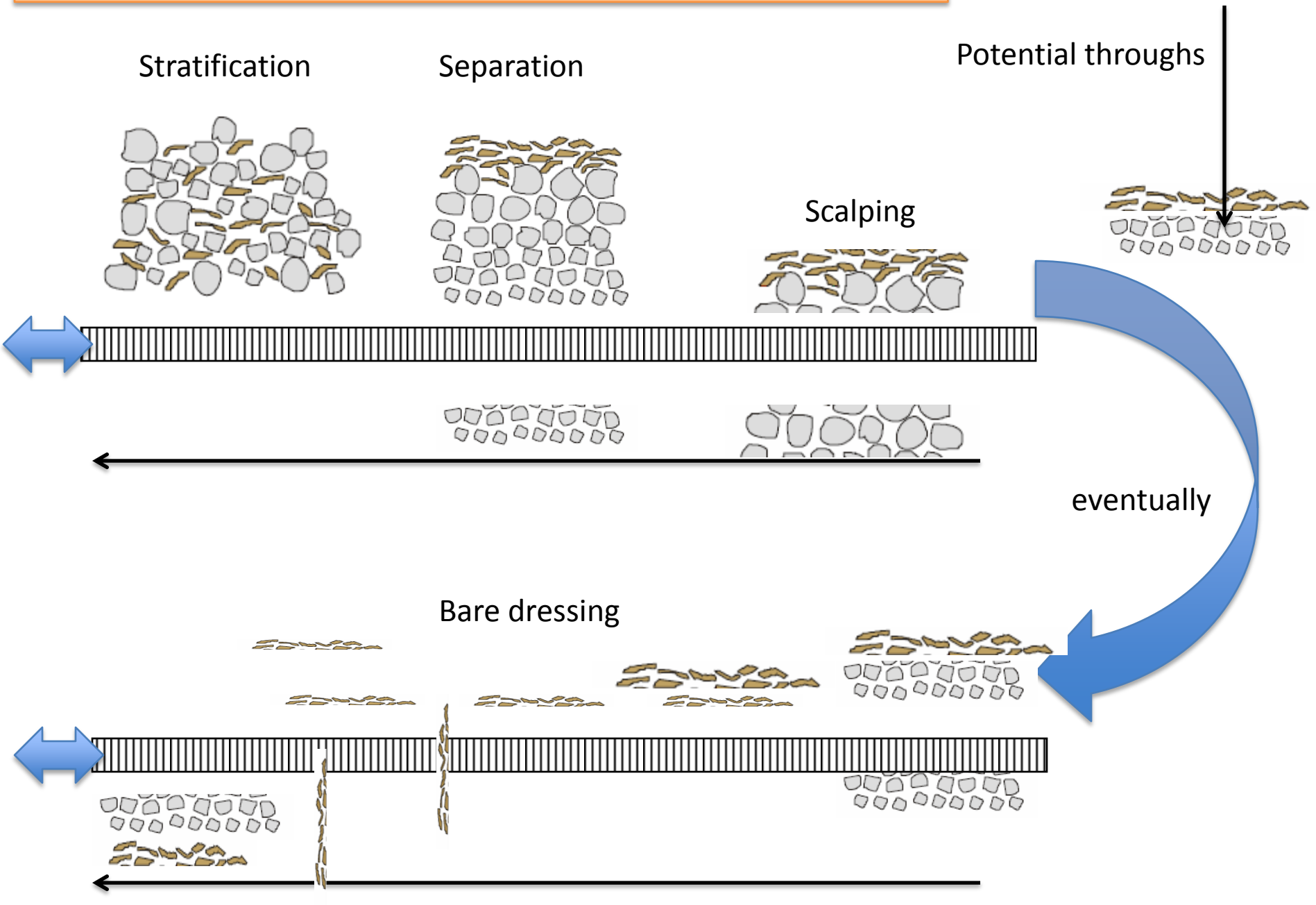


A well adjusted purifier:

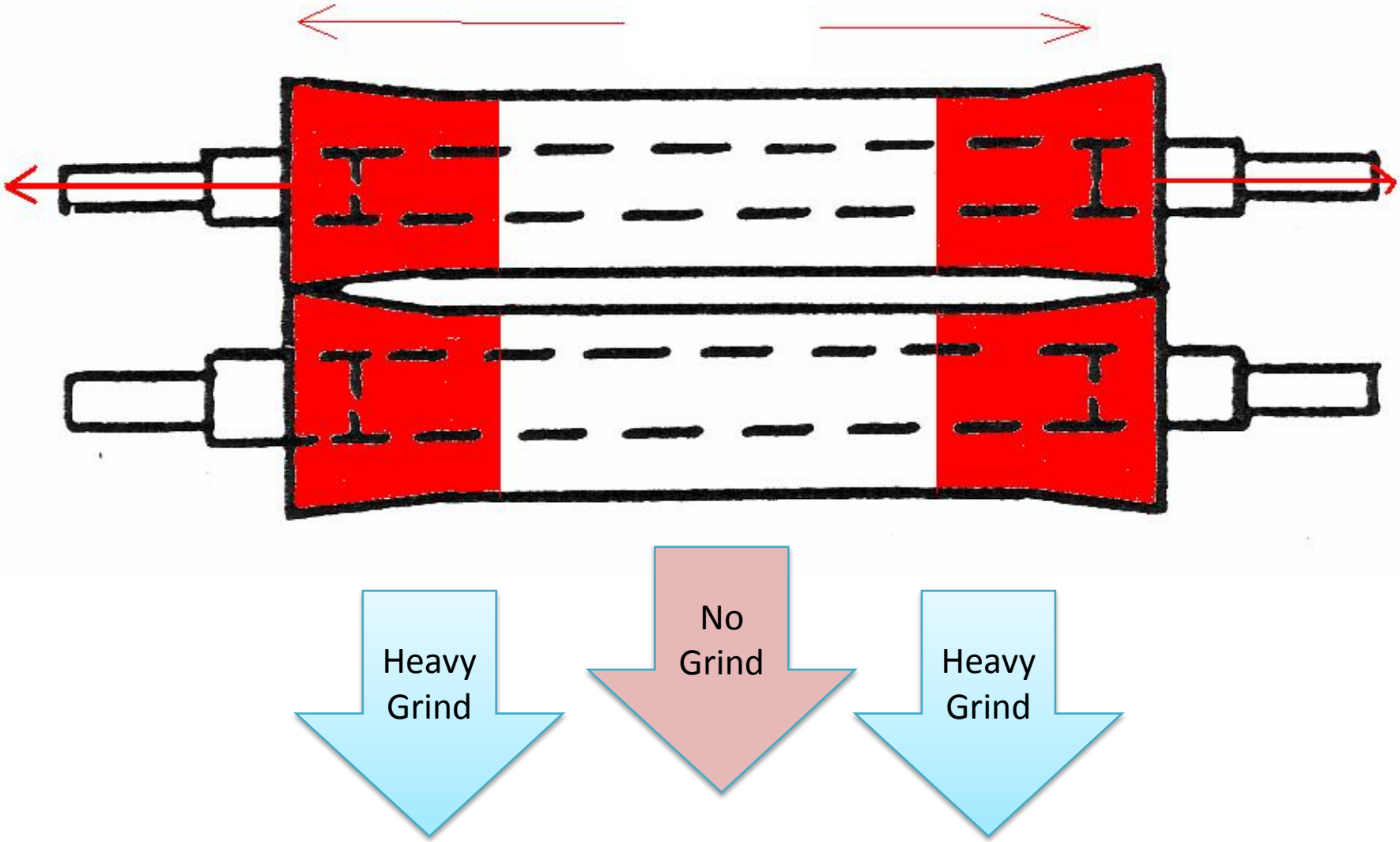
Air is Lazy!!

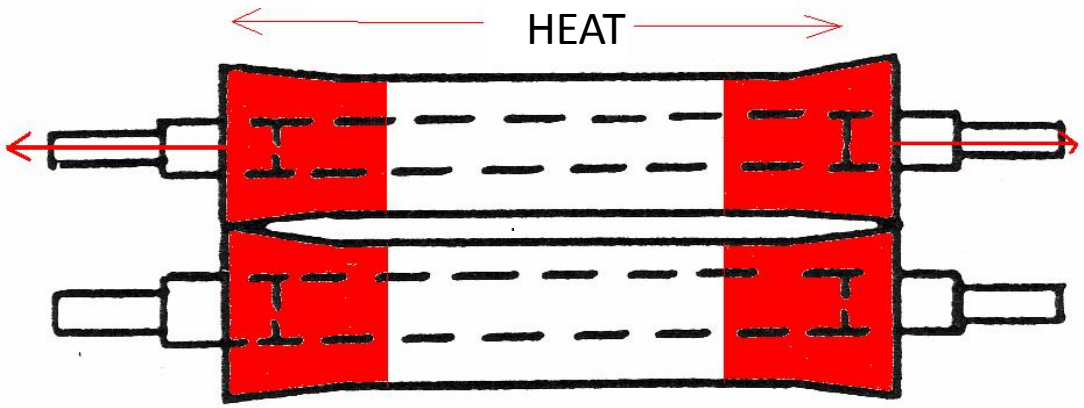


Bare Dressing and Potential Throughs



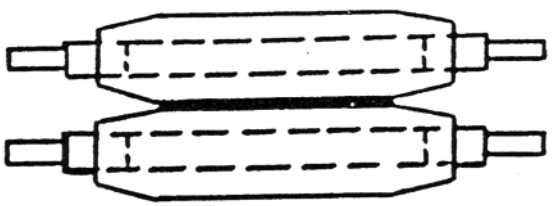
Hollow Grinding

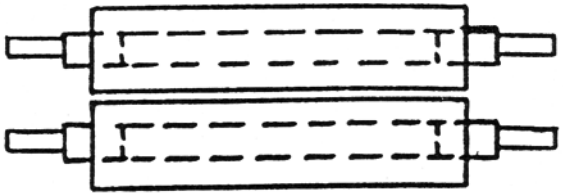


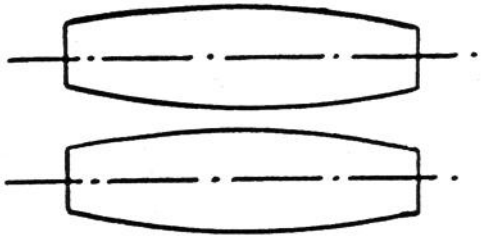


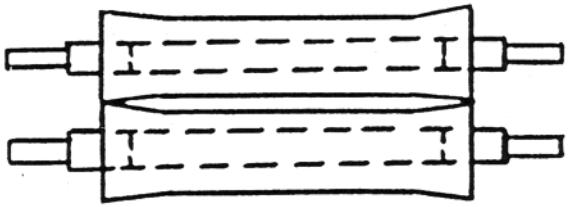
Roll Taper

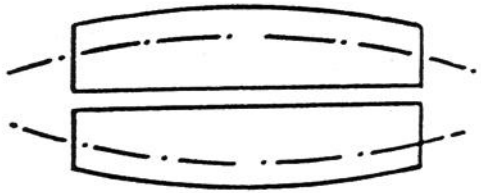
Or Camber



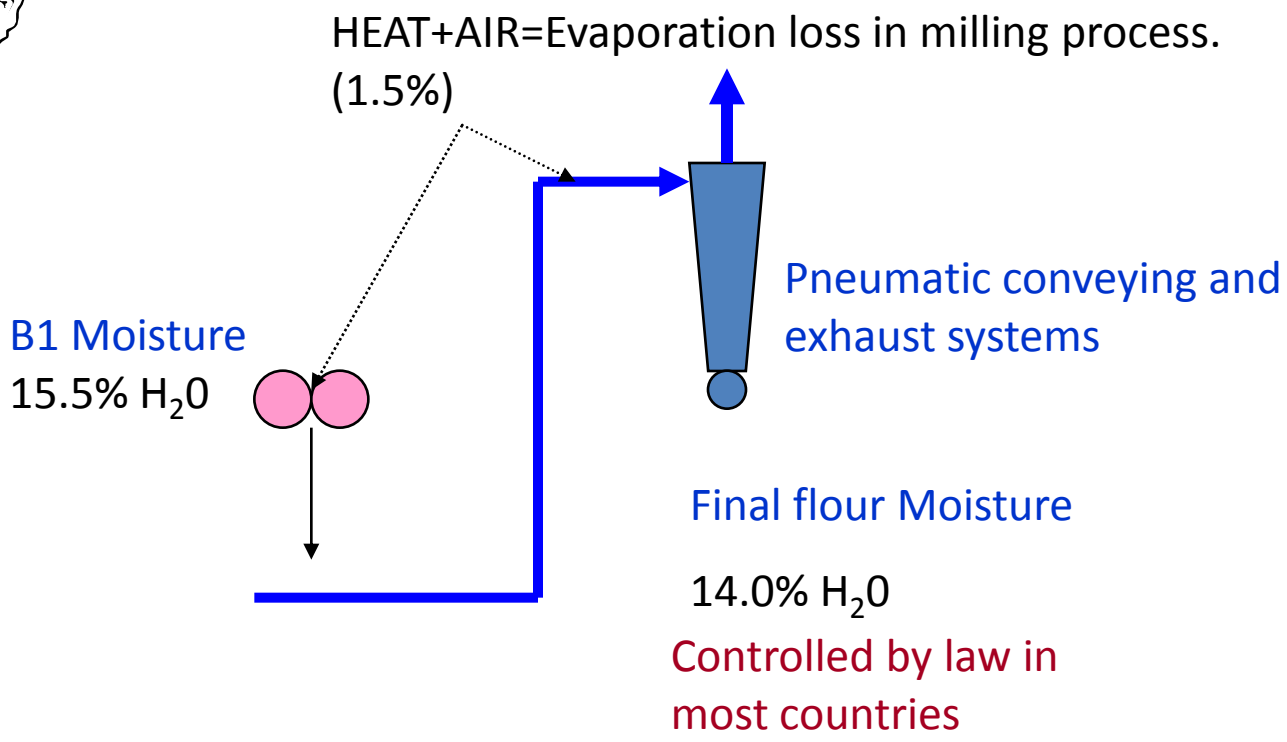








Evaporation loss



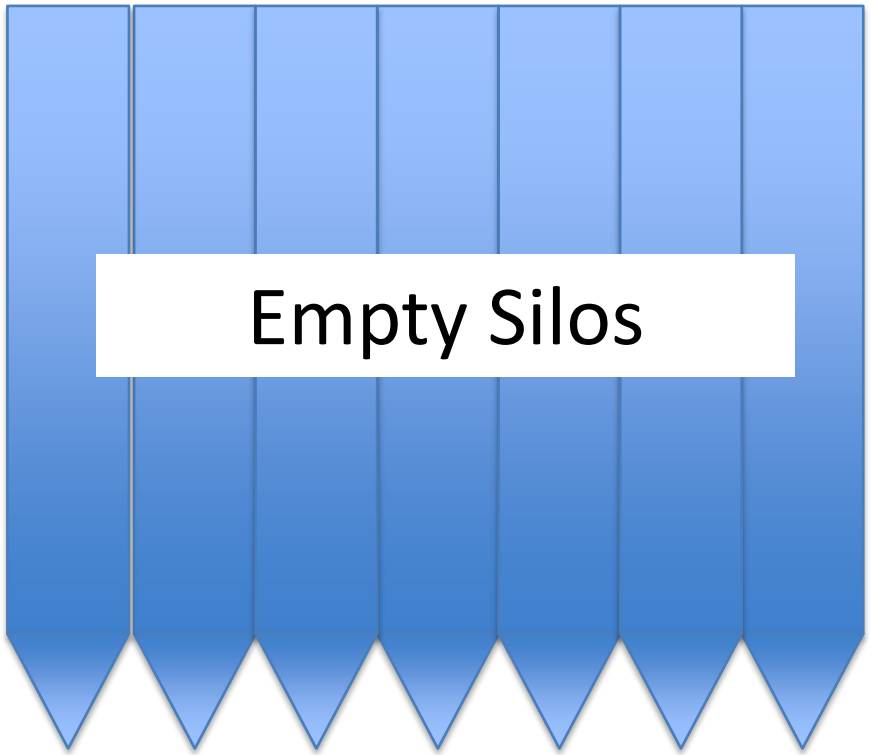
Final flour moisture + evaporation loss = B1 moisture.

(± wheat hardness optimization)

HydroMax?

Silo Loss

100,000 Tons IN

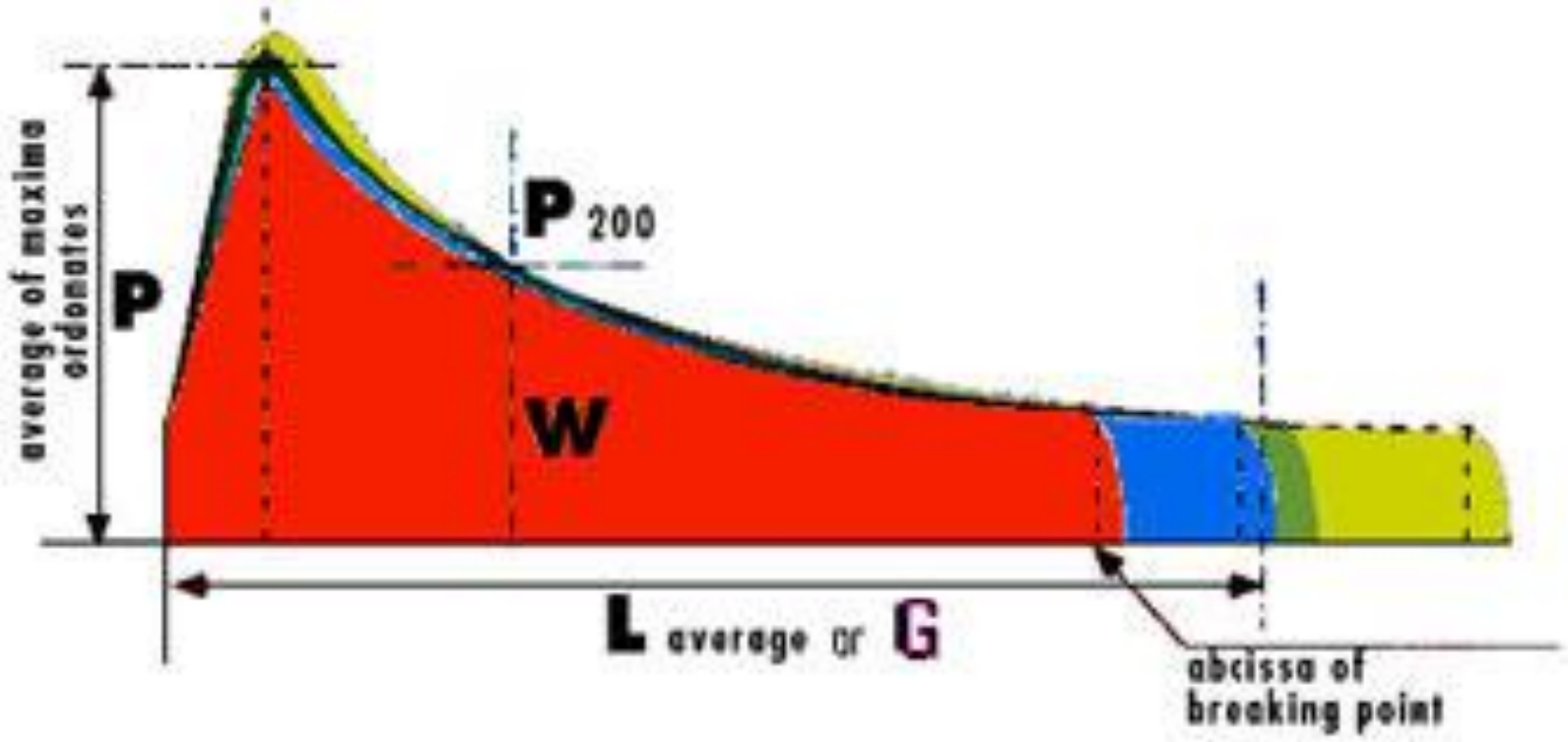


WHY?
HOW?
HOW MUCH?

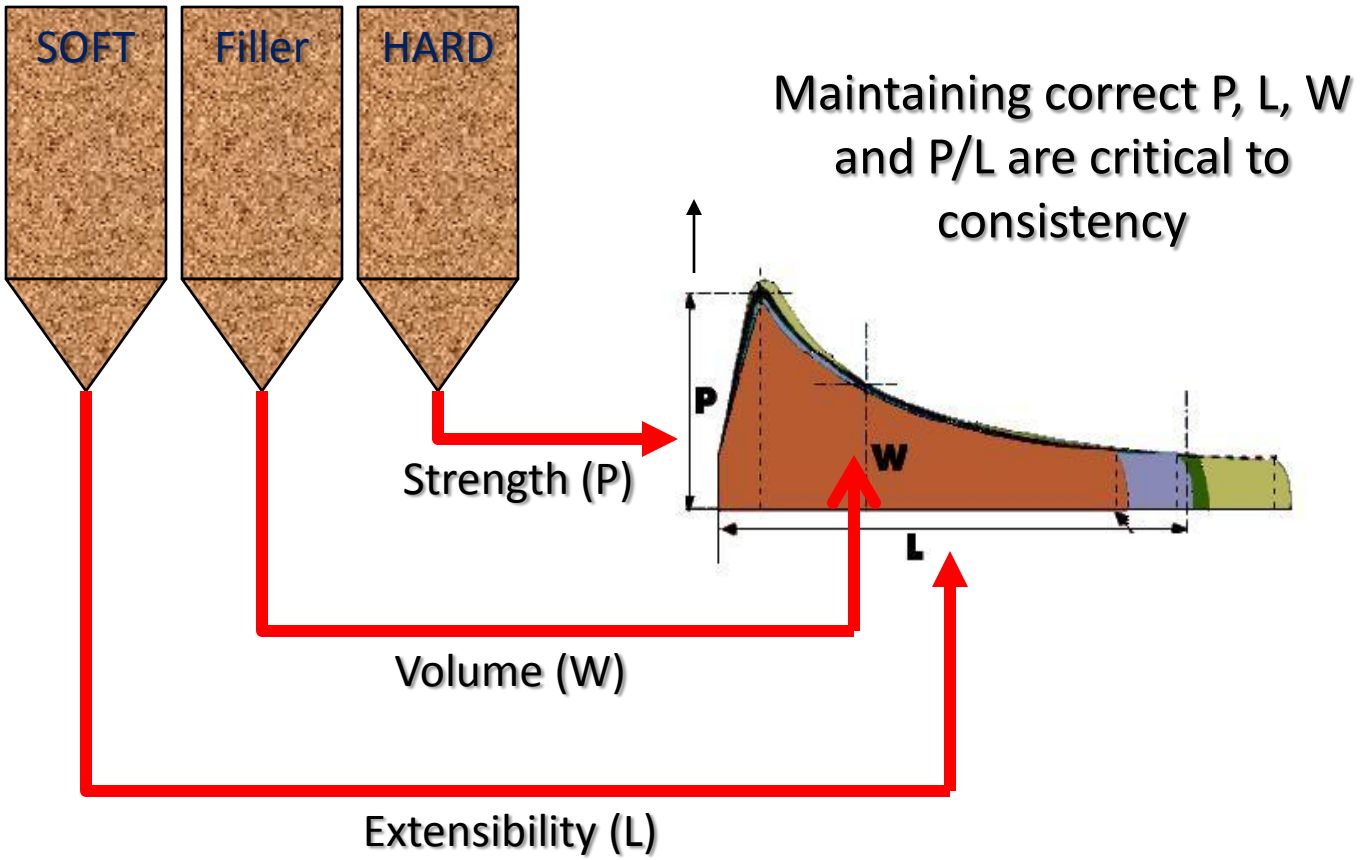
Temperature?
Rel. Humidity?
Moisture?

99,000 Tons OUT

Alveogram


average of maxima ordonates
P
P 200
W
L average or G
abcissa of breaking point

BLENDING
Reducing costs & maintaining functional consistency

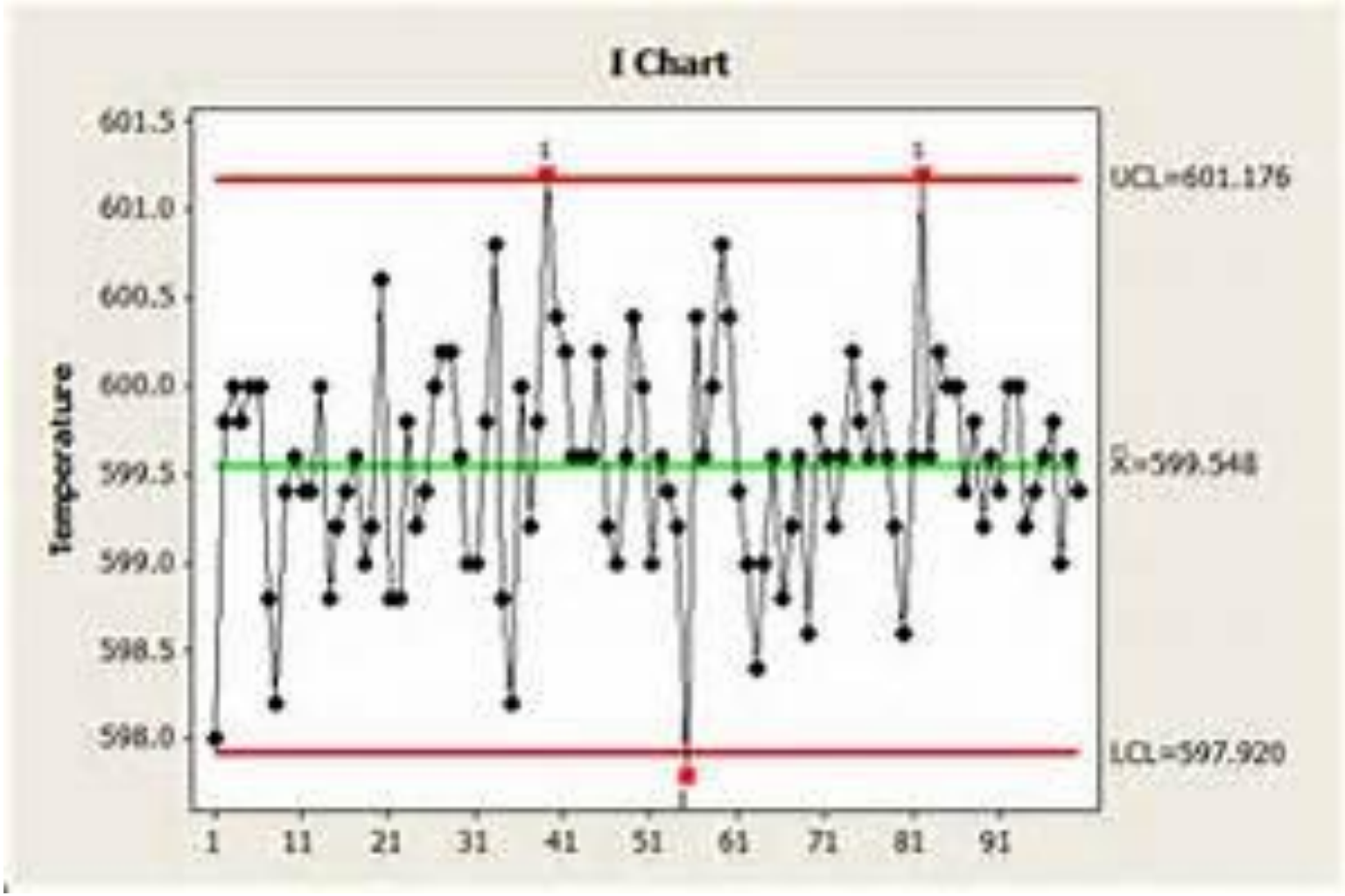


REPORTS

Laboratory Reports

Production Reports

THERE IS GOLD IN THOSE PAPERS – IF YOU KNOW WHERE TO LOOK!!



Process Quality Variability Chart – examples like B1 Moisture, Flour Protein etc.

You cannot measure what you don't know

US Grain System
Impact of specification terms

Specification	Average	Minimum	Maximum
'Ordinary'	As loaded	None	None
Average	Spec.	None	None
Minimum	Spec	Spec -0.5% Lowest s/lot	None
Min. by sublot	Spec	Spec	None
Range specification	Spec	Min. spec	Max. spec.

Slide – Table of Variability

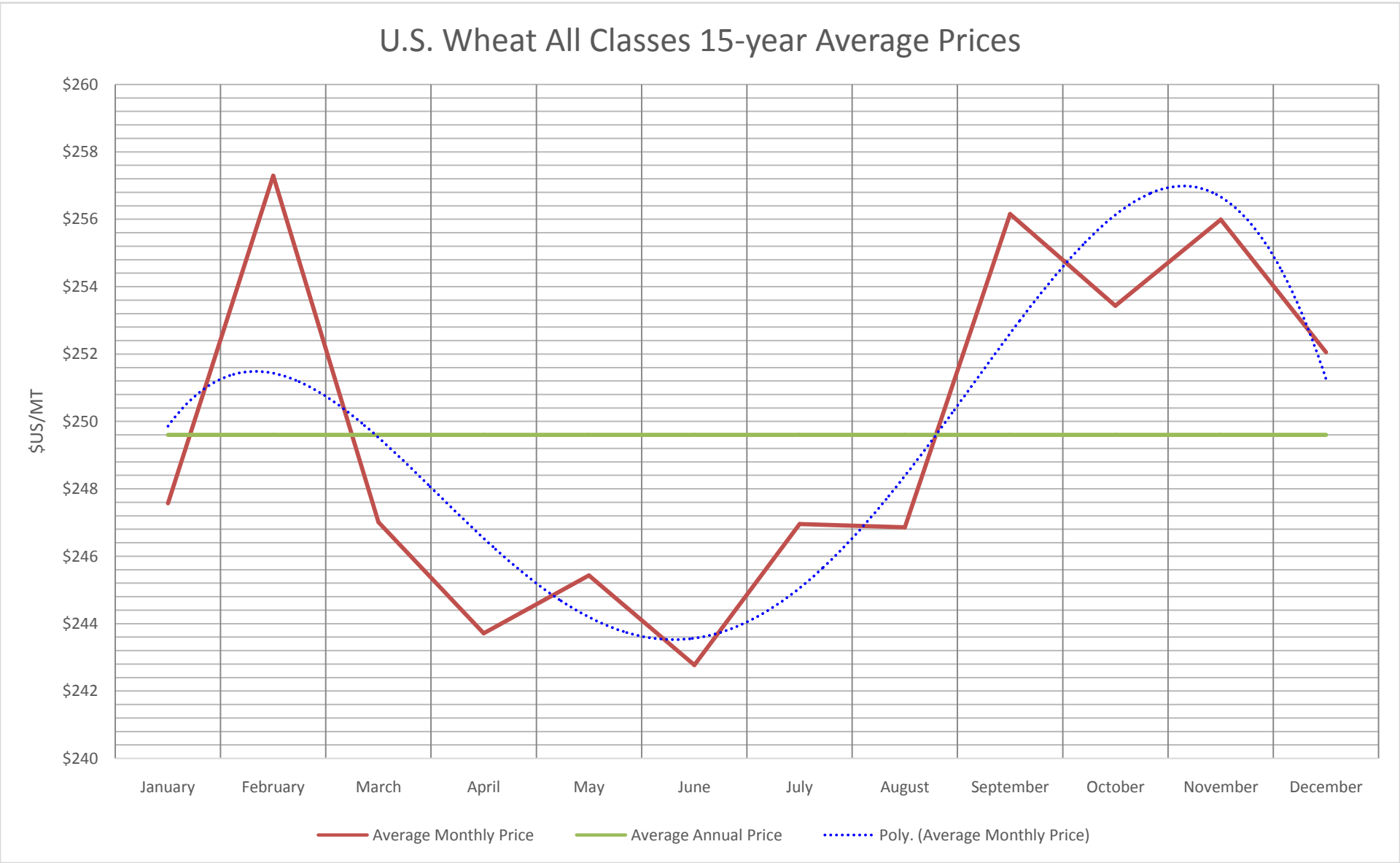
Hard Red Spring Wheat						
Wheat				Flour.		
Protein (12% Moisture Basis)	12%	DB	-1% Milling loss		Wet Gluten	Flour Protein 14% mb
Specification Basis:	**Minimum**	DB wheat	Mill loss			Flour
Specification:	**14.0**	15.9	14.9		**34.6**	**12.8**
High:	**14.3**	16.3	15.3		**35.5**	**13.1**
Low:	**13.8**	15.7	14.7		**34.0**	**12.6**
Average:	**14.0**	15.9	14.9		**34.6**	**12.8**

FLOUR		
Range	Protein14%m/b	Wet Gluten
High:	13.1	35.5
Low:	12.6	34.0
Average:	12.8	34.6

Is this acceptable to your customers?

Timing your purchases to take advantage of the lowest prices.

Note – there are lead times for internal transport and shipping



On behalf of all of us at the US Wheat Associates team, Thank you for your attention, and thank you for your valued business over the past year. We wish you every continued success in the future.

IAOM Regional Forum, Cairo Egypt. 2016

Net Profit Margin

- The net profit margin is a number which indicates the efficiency of a company at its cost control. A higher net profit margin shows more efficiency of the company at converting its revenue into actual profit.
- This ratio is a good way of making comparisons between companies in the same industry.
- The formula for computing the Net Profit Margin is:

Net Profit / Net Sales

Financial Ratios

- Financial ratios are useful indicators of a firm's performance and financial situation. Most ratios can be calculated from information provided by the financial statements.
- Financial ratios can be used to analyze trends and to compare the firm's financials to those of other firms. In some cases, ratio analysis can predict future bankruptcy.
- Financial ratios can be classified according to the information they provide. The following types of ratios frequently are used:
  - **Liquidity ratios**
  - **Asset turnover ratios**
  - **Financial leverage ratios**
  - **Profitability ratios**
  - **Dividend policy ratios**

Liquidity Ratios

- Liquidity ratios provide information about a firm's ability to meet its short-term financial obligations.
- They are of particular interest to those extending short-term credit to the firm.
- Two frequently-used liquidity ratios are the current ratio (or working capital ratio) and the quick ratio.

Cash Ratio

- Finally, the cash ratio is the most conservative liquidity ratio. It excludes all current assets except the most liquid: cash and cash equivalents.
- The cash ratio is defined as follows:

$$\text{Cash Ratio} = \frac{\text{Cash + Marketable Securities}}{\text{Current Liabilities}}$$

- The cash ratio is an indication of the firm's ability to pay off its current liabilities if for some reason immediate payment were demanded.

Asset Turnover Ratios

- Asset turnover ratios indicate of how efficiently the firm utilizes its assets.
- They sometimes are referred to as efficiency ratios, asset utilization ratios, or asset management ratios.
- Two commonly used asset turnover ratios are receivables turnover and inventory turnover.

Receivables Turnover

- Receivables turnover is an indication of how quickly the firm collects its accounts receivables and is defined as follows:

$$\text{Receivables Turnover} = \frac{\text{Annual Credit Sales}}{\text{Accounts Receivable}}$$

Receivables Turnover

- The receivables turnover often is reported in terms of the number of days that credit sales remain in accounts receivable before they are collected. This number is known as the
- collection period. It is the accounts receivable balance divided by the average daily credit sales, calculated as follows:

$$\text{Average Collection Period} = \frac{\text{Accounts Receivable}}{\text{Annual Credit Sales} / 365}$$

- The collection period also can be written as:

$$\text{Average Collection Period} = \frac{365}{\text{Receivables Turnover}}$$

Inventory Turnover

- Another major asset turnover ratio is inventory turnover. It is the cost of goods sold in a time period divided by the average inventory level during that period:

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Inventory Period

- The inventory turnover often is reported as the inventory period, which is the number of days worth of inventory on hand, calculated by dividing the inventory by the average daily cost of goods sold:

$$\text{Inventory Period} = \frac{\text{Average Inventory}}{(\text{Annual Cost of Goods Sold} / 365)}$$

- The inventory period also can be written as:

$$\text{Inventory Period} = \frac{365}{\text{Inventory Turnover}}$$

- Other asset turnover ratios include fixed asset turnover and total asset turnover.

Financial Leverage Ratios

- Financial leverage ratios provide an indication of the long-term solvency of the firm.
- Unlike liquidity ratios that are concerned with short-term assets and liabilities, financial leverage ratios measure the extent to which the firm is using long term debt.

Interest Coverage or Times Interest Earned Ratio

- The times interest earned ratio indicates how well the firm's earnings can cover the interest payments on its debt. This ratio also is known as the interest coverage and is calculated as follows:

$$\text{Interest Coverage} = \frac{\text{EBIT}}{\text{Interest Charges}}$$

*EBIT = Earnings Before Interest and Taxes

Profitability Ratios

- Profitability ratios offer several different measures of the success of the firm at generating profits.
- The gross profit margin is a measure of the gross profit earned on sales. The gross profit margin considers the firm's cost of goods sold, but does not include other costs. It is defined as follows:

$$\text{Gross Profit Margin} = \frac{\text{(Sales - Cost of Goods Sold)}}{\text{Sales}}$$

Return on Assets (ROA)

- Return on assets is a measure of how effectively the firm's assets are being used to
- generate profits. It is defined as:

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Dividend Policy Ratios

- Dividend policy ratios provide insight into the dividend policy of the firm and the prospects for future growth. Two commonly used ratios are the dividend yield and payout ratio.
- The dividend yield is defined as follows:

$$\text{Dividend Yield} = \frac{\text{Dividends Per Share}}{\text{Share Price}}$$

- A high dividend yield does not necessarily translate into a high future rate of return. It is important to consider the prospects for continuing and increasing the dividend in the future. The dividend payout ratio is helpful in this regard, and is defined as follows:

$$\text{Payout Ratio} = \frac{\text{Dividends Per Share}}{\text{Earnings Per Share}}$$

Use and Limitations of Financial Ratios

Attention should be given to the following issues when using financial ratios:

- A reference point is needed. To to be meaningful, most ratios must be compared to historical values of the same firm, the firm's forecasts, or ratios of similar firms.
- Most ratios by themselves are not highly meaningful. They should be viewed as indicators, with several of them combined to paint a picture of the firm's situation.
- Year-end values may not be representative. Certain account balances that are used to calculate ratios may increase or decrease at the end of the accounting period because of seasonal factors. Such changes may distort the value of the ratio.
- Average values should be used when they are available.